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ABSTRACT

This study compared the responses of 4,068 alumni with different academic majors on a questionnaire of dimensions of growth and development (personal/social skills, quantitative skills, verbal skills, and cultural understanding skills) to determine if students with different academic majors responded differentially to these dimensions. The Alumni Satisfaction Survey was administered to graduates from the Universities of Tennessee at Chattanooga, Martin, and Knoxville. Analysis revealed considerable differences among alumni with different majors. Alumni who majored in such areas as as communication, education, human ecology, and nursing believed their education developed their personal/social skills; whereas alumni who majored in agriculture, business, engineering, science, and nursing felt their majors facilitated growth and development in quantitative skills; agriculture and communication majors felt their educational experience developed their verbal skills; and alumni with architecture, communication, human ecology, humanities, or social science majors believed that their education contributed to their cultural understanding. Findings suggests that, although the curriculum, and possibly the ethos, of an academic department appears to reinforce certain dimensions of growth and development more than others, the context of the collegiate experience may have the strongest influence. The appendix presents the study's statistical data. (Contains an 11-item bibliography.) (GLR)

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ACADEMIC MAJOR AND ALUMNI PERCEPTIONS OF GROWTH AND DEVELOPMENT

A Contributed Paper
1993 AIR Forum

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Introduction and Purpose

Research studies in higher education cannot conciusively account for the impact of college upon students (Alexander and Eckland, 1977; Pascarella, Smart, Ethington, and Nettles, 1987; Pascarella & Terenzini, 1991; Stoecker and Pascarella, 1988; Stoecker, Pascarella, & Wolfe, 1988). Many research efforts which have attempted to isolate the effect of specific educational experiences from external influences, such as student background or maturation have produced conflicting results (Pascarella & Terenzini, 1991). Further, research findings pertaining to the effect of academic major upon outcomes such as educational attainment and socialization produce conflicting results.

The purpose of this study is to compare the responses of alumni with different academic majors to the dimensions of growth and development questions (personal/social skills, quantitative skills, verbal skills, and cultural understanding skills) on the Tennessee Alumni Satisfaction Survey. The study answered the question: Do alumni with different academic majors differ in their responses to the dimensions of growth and development questions on the Alumni Satisfaction Survey?

Literature Review

Weidman (1989) suggests that the norms and mores unique to individual academic departments influence socialization outcomes. These influences, manifest through faculty behavior and expectations as well as performance in courses and social interaction, may effect the perceptions of alumni about the impact of their education. According to Vreeland and Bidwell (1966), an academic department has "relatively well-defined goals and expectations for

students, and commands powerful normative and utilitarian sanctions" (p.238). The faculty in a department, therefore, can exert considerable influence over students through imposing both social and academic conformity to the norms of the group.

Haugen (1988) reports a significant association between satisfaction with educational preparation, and academic majors in health. Yet other studies pertaining to academic major and educational attainment reveal conflicting results (Thomas & Gordan, 1983; Sharp, 1970; Alexander & Eckland, 1977; Pascarella, Smart, Ethington, and Nettles, 1987).

Methods and Procedures

The population for this study was all 1986 and 1988 alumni of the baccalaureate degree programs from The University of Tennessee--Chattanooga, Martin, and Knoxville. Total instruments mailed was 9,075 and responses received was 4,068 (44.8% response rate). Data were collected by the three institutions using the state adopted Alumni Satisfaction Survey (Appendix). Studies of the alumni survey instrument were conducted by Pike (1991) to establish the construct validity of the instrument and the dimensions of growth and development present in the questions. A confirmatory factor analysis revealed a modified four-factor model as providing the best explanation for the data. The factors identified were; personal/social (9 questions), quantitative (5 questions), verbal (4 questions), and cultural understanding (5 questions). The data were also classified according to academic major.

The classification of academic major is according to the "ten-digit code of the Academic Inventory taxonomy of major areas found in the listing 'Academic Inventory of Programs in Public Institutions,' as published by the Tennessee Higher Education Commission"

(Performance Funding Alumni Survey). The classification of academic majors was collapsed into categories consistent with the academic college from which the major was granted to facilitate reporting. These categories are; agriculture, architecture, business, communications, education, engineering, human ecology, humanities, science, social science, and nursing.

Survey participants were asked to "indicate the degree to which education added to your skills in each of the following areas" (Survey, 1988). Likert-type scale responses were Very Little, Somewhat, and Very Much. Frequencies were calculated and data were analyzed using Likelihood-Ratio Chi-Square. The Maximum Likelihood-Ratio Chi-Square uses natural logarithms which possess the property of multiplicity and is more desirable in log-linear analysis (Kennedy, 1992).

Findings

The results of the chi-squre test for statistical difference between responses from alumni with different academic majors revealed that there is a significant difference between responses to the growth and development questions at the $p < .05$ level. Agriculture, business, communication, education, human ecology, and nursing majors believe that their education added Very Much to their personal/social skills. Architecture, humanities, science, and social science majors believe that their education added Very Little to their personal/social skills.

Agriculture, business, engineering, science, and nursing majors believe that their education added Very Much to their quantitative skills. Communication, education, human ecology, humanities, and social science majors believe that their education added Very Little to their quantitative skills.

Agriculture and communication majors believe that their education added Very Much to their verbal skills. Engineering, humanities, and science majors believe that their education added Very Little to their verbal skills.

Architecture, communication, human ecology, humanities, and social science majors believe that their education added Very Much to their cultural understanding. Agriculture, business, education, engineering, and science majors believe that their education added Very Little to their cultural understanding. A summary of the findings is found in Table 1.

Table 1
Summary of Findings

Majors		Responses		
	Personal Social	Quantitative	Verbal	Cultural Understanding
Agriculture	VMuch	Somewhat VMuch	VMuch	VLittle
Architecture	VLittle	Somewhat		VMuch
Business	VMuch	Somewhat VMuch	Somewhat	VLittle Somewhat
Communication	VMuch	VLittle	VMuch	Somewhat VMuch
Education	VMuch	VLittle Somewhat	Somewhat	VLittle
Engineering		VMuch	VLittle	VLittle
Human Ecology	VMuch	VLittle		VMuch
Humanities	VLittle	VLittle	VLittle	VMuch
Science	VLittle	VMuch	VLittle	VLittle
Social Science	VLittle	VLittle		VMuch
Nursing	VMuch	VMuch		Somewhat

Conclusions and Discussion

The significant difference between the responses of alumni with different academic majors leads us to conclude that educational experiences in academic majors are a contributing factor to the differences in perceived contribution of education to the growth and development factors. It is evident in the findings of this study that some academic majors such as communication, human ecology, and nursing facilitate growth and development in personal/social skills. This supports Haugen's, (1988) finding about alumni with academic majors in health. Some academic majors such as engineering and science facilitate growth and development in quantitative skills. The educational experience that communication majors receive tends to develop verbal skills. And, cultural understanding skills tend to be developed in human ecology and social science majors.

Although the curriculum, and possibly the ethos, of an academic department is likely to reinforce certain dimensions of growth and development more than others, other dimensions of this study indicate that the strongest influence may be the context of the collegiate experience. That is to say, the combination of factors such as enrollment size, individual faculty members, the goals or mission of the academic department, student cohort group, unique curriculum attributes of the academic major, or general education requirements impact the student more than any singularly identified variable such as academic major. Consequently, the strength of this study, and any studies which follow, may lie in its contribution to the assessment of the educational program under consideration. This, however, may be no insignificant contribution when considering the emphasis regional accrediting agencies place upon alumni perceptions of institutional effectiveness in meeting goals.

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APPENDIX

Your Education and Its Impact

Question 11. In answering the question in this section, please think of your overall experience at (name of institution), and any effect it may have had on each item. Please indicate the degree to which your education at (name of institution) added to your skills in each of the following areas.

	Very Little	Somewhat	Very Much
1. Practical skills necessary to obtain employment in your field.	1	2	3
2. Getting along with people of different races and ethnic groups.	1	2	3
3. Ability to grow and learn as a person.	1	2	3
4. Ability to lead or guide others.	1	2	3
5. Ability to adjust to new job demands.	1	2	3
6. Self-confidence in expressing your ideas.	1	2	3
7. Appreciation of different cultures.	1	2	3
8. Planning and carrying out projects.	1	2	3
9. Speaking effectively.	1	2	3
10. Writing effectively.	1	2	3
11. Understanding written information.	1	2	3
12. Understanding graphic information.	1	2	3
13. Learning on your own.	1	2	3
14. Defining and solving problems.	1	2	3
15. Working cooperatively in a group.	1	2	3
16. Ability to understand mathematical concepts.	1	2	3
17. Understanding the interaction between people and the environment.	1	2	3
18. Understanding and appreciating the arts.	1	2	3
19. Understanding and applying scientific principles and methods.	1	2	3
20. Understanding different philosophies and cultures.	1	2	3
21. Ability to use mathematics in everyday life.	1	2	3

Questions 12. (first part only) What was your major?

Chi-Square Test for Significance
Personal/Social by Major

Statistic	Value	D.F.	Prob.
Pearson Chi-Square	231.931	20	0.0000
Likelihood-Ratio Chi-Square	222.623	20	0.0000
Phi	0.085		

calculated value to 4 decimal places

Expected/Observed Frequency and Percent Table
Personal/Social by Major

Major		Response		
	VLittle	Somewhat	VMuch	Total
Agriculture				
Expected	138.4	646.6	831.1	1616
Observed	107*-	647	862*	1616
Difference	31.4	.4	30.9	0
Obs. % of Total	6.6%	40.0%	53.3%	100.0%
Architecture				
Expected	47.9	224.1	288.0	560
Observed	35*-	235	290	560
Difference	12.9	10.9	2.0	0
Obs. % of Total	6.2%	42.0%	51.8%	100.0%
Business				
Expected	787.7	3681.0	4731.3	9200
Observed	682*-	3671	4847*	9200
Difference	105.7	10.0	115.7	0
Obs. % of Total	7.4%	39.0%	52.7%	100.0%
Communications				
Expected	193.8	905.8	1164.3	2264
Observed	184	836	1244*	2264
Difference	9.8	69.8	79.7	0
Obs. % of Total	8.1%	36.9%	54.9%	100.0%

table cont'd	VLittle	Somewhat	VMuch	Total
Education				
Expected	282.7	1321.1	1698.1	3302
Observed	230*-	1271	1801*	3302
Difference	52.7	50.1	102.9	0
Obs. % of Total	7.0%	38.5%	54.5%	100.0%
Engineering				
Expected	365.4	1707.6	2194.9	4268
Observed	373	1740	2155	4268
Difference	7.6	32.4	39.9	0
Obs. % of Total	8.7%	40.8%	50.5%	100.0%
Human Ecology				
Expected	89.0	416.1	534.8	1040
Observed	80	362*-	598*	1040
Difference	9.0	54.1	63.2	0
Obs. % of Total	7.7%	34.8%	57.5%	100.0%
Humanities				
Expected	127.4	595.4	765.2	1488
Observed	212*	612*-	664*-	1488
Difference	84.6	16.6	101.2	0
Obs. % of Total	14.2%	41.1%	44.6%	100.0%
Science				
Expected	228.1	1065.9	1370.0	2664
Observed	312*	1152	1200*-	2664
Difference	83.9	86.1	170.0	0
Obs. % of Total	11.7%	43.2%	45.0%	100.0%
Social Science				
Expected	383.6	1792.5	2304.0	4480
Observed	453*	1846	2181*-	4480
Difference	69.4	53.5	123	0
Obs. % of Total	10.1%	41.2%	48.7%	100.0%
Nursing				
Expected	132.9	621.0	798.2	1552
Observed	109*-	605	838*	1552
Difference	23.9	16.0	39.8	0
Obs. % of Total	7.0%	39.0%	54.0%	100.0%
TOTAL	2777	12977	16680	32434
	8.6%	40.0%	51.4%	100.0%

*$p < .05$
- denotes less than expected frequency

Chi-Square Test for Significance
Quantitative by Major

Statistic	Value	D.F.	Prob.
Pearson Chi-Square	2358.760	20	0.0000
Likelihood-Ratio Chi-Square	2308.566	20	0.0000
Phi	0.381		

calculated value to 4 decimal places

Expected/Observed Frequency and Percent Table
Quantitative by Major

Major		Response		
	VLittle	Somewhat	VMuch	Total
Agriculture				
Expected	144.1	345.9	317.9	808
Observed	93*-	385*	330*	808
Difference	51.1	39.1	12.1	0
Obs. % of Total	11.5%	47.6%	40.8%	100.0%
Architecture				
Expected	49.9	119.9	110.2	280
Observed	45	142*	93	280
Difference	4.9	22.1	17.2	0
Obs. % of Total	16.1%	50.7%	33.2%	100.0%
Business				
Expected	820.6	1969.3	1810.1	4600
Observed	636*-	2270*	1694*	4600
Difference	184.6	300.7	116.1	0
Obs. % of Total	13.8%	49.3%	36.8%	100.0%
Communications				
Expected	201.9	484.6	445.4	1132
Observed	420*	509	203*-	1132
Difference	218.1	24.4	242.4	0
Obs. % of Total	37.1%	45.0%	17.9%	100.0%

table cont'd	VLittle	Somewhat	VMuch	Total
Education				
Expected	295.4	709.0	651.6	1656
Observed	333*	809*	514*-	1656
Difference	37.6	100.0	137.6	0
Obs. % of Total	20.1%	48.9%	31.0%	100.0%
Engineering				
Expected	389.6	935.0	859.4	2184
Observed	84*-	477*-	1623*	2184
Difference	305.6	458.0	763.6	0
Obs. % of Total	3.8%	21.8%	74.3%	100.0%
Human Ecology				
Expected	91.0	218.3	200.7	510
Observed	111*	229	170*-	510
Difference	20.0	10.7	30.7	0
Obs. % of Total	21.8%	44.9%	33.3%	100.0%
Humanities				
Expected	132.7	318.5	292.8	744
Observed	309*	278*-	157*-	744
Difference	176.3	40.5	135.8	0
Obs. % of Total	41.5%	37.4%	21.1%	100.0%
Science				
Expected	237.6	570.2	524.1	1332
Observed	134*-	479*-	719*	1332
Difference	103.6	91.2	194.9	0
Obs. % of Total	10.1%	36.0%	54.0%	100.0%
Social Science				
Expected	399.6	959.0	881.4	2240
Observed	621*	1030	589*-	2240
Difference	221.4	71.0	292.4	0
Obs. % of Total	27.7%	46.0%	26.3%	100.0%
Nursing				
Expected	138.4	332.2	305.4	776
Observed	115*-	354	307*	776
Difference	23.4	21.8	1.6	0
Obs. % of Total	14.8%	45.6%	39.6%	100.0%
TOTAL	2901	6962	6399	16262
% of Total	17.8%	42.8%	39.3%	100.0%

*$p < .05$
- denotes less than expected frequency

Chi-Square Test for Significance
Verbal by Major

Statistic	Value	D.F.	Prob.
Pearson Chi-Square	196.337	20	0.0000
Likelihood-Ratio Chi-Square	191.941	20	0.0000
Phi	0.110		

calculated value to 4 decimal places

Expected/Observed Frequency and Percent Table
Verbal by Major

Major	Response			
	VLittle	Somewhat	VMuch	Total
Agriculture				
Expected	87.4	358.4	362.2	808
Observed	60*-	351	397*	808
Difference	27.4	7.4	34.8	0
Obs. % of Total	7.4%	43.4%	49.1%	100.0%
Architecture				
Expected	30.3	124.2	125.5	280
Observed	30	130	120	280
Difference	.3	5.8	5.5	0
Obs. % of Total	10.7%	46.4%	42.9%	100.0%
Business				
Expected	497.5	2040.6	2061.8	4600
Observed	413*-	2114*	2073	4600
Difference	84.5	73.4	11.2	0
Obs. % of Total	9.0%	46.0%	45.1%	100.0%
Communications				
Expected	122.4	502.2	507.4	1132
Observed	79*-	402	651*	1132
Difference	43.4	100.2	143.6	0
Obs. % of Total	7.0%	35.5%	57.5%	100.0%

table cont'd	VLittle	Somewhat	VMuch	Total
Education				
Expected	179.1	734.6	742.3	1656
Observed	166	784*	706	1656
Difference	13.1	49.4	36.3	0
Obs. % of Total	10.0%	47.3%	42.6%	100.0%
Engineering				
Expected	236.2	968.9	978.9	2184
Observed	297*	952*-	935*-	2184
Difference	60.8	16.9	43.9	0
Obs. % of Total	13.6%	43.6%	42.8%	100.0%
Human Ecology				
Expected	56.3	231.1	233.5	521
Observed	47	229	245	521
Difference	9.3	2.1	11.5	0
Obs. % of Total	9.0%	44.0%	47.0%	100.0%
Humanities				
Expected	80.5	330.1	333.5	744
Observed	115*	290*-	339	744
Difference	34.5	40.1	5.5	0
Obs. % of Total	15.5%	39.0%	45.6%	100.0%
Science				
Expected	144.1	590.9	597.0	1332
Observed	213*	592*-	527*-	1332
Difference	68.9	1.1	70.0	0
Obs. % of Total	16.0%	44.4%	39.6%	100.0%
Social Science				
Expected	242.3	993.7	1004.0	2240
Observed	252	1019	969	2240
Difference	9.7	25.3	35.0	0
Obs. % of Total	11.2%	45.5%	43.3%	100.0%
Nursing				
Expected	83.9	344.2	347.8	776
Observed	88	356	332	776
Difference	4.1	11.8	15.8	0
Obs. % of Total	11.3%	45.9%	42.8%	100.0%
TOTAL	1760	7219	7294	16273
% of Total	10.8%	44.4%	44.8%	100.0%

*$p < .05$
- denotes less than expected frequency

Chi-Square Test for Significance
Cultural Understanding by Major

Statistic	Value	D.F.	Prob.
Pearson Chi-Square	678.844	20	0.0000
Likelihood-Ratio Chi-Square	673.746	20	0.0000
Phi	0.183		

calculated value to 4 decimal places

Expected/Observed Frequency and Percent Table
Cultural Understanding by Major

Major		Response		
	VLittle	Somewhat	VMuch	Total
Agriculture				
Expected	227.6	475.7	306.7	1010
Observed	255*	487	268*-	1010
Difference	27.4	11.3	38.7	0
Obs. % of Total	25.2%	48.2%	26.5%	100.0%
Architecture				
Expected	78.9	164.8	106.3	350
Observed	51*-	141	158*	350
Difference	27.9	23.8	51.7	0
Obs. % of Total	14.6%	40.3%	45.1%	100.0%
Business				
Expected	1290.5	2696.7	1738.8	5726
Observed	1482*	2823*	1421*-	5726
Difference	191.5	126.3	317.8	0
Obs. % of Total	25.9%	49.3%	24.8%	100.0%
Communications				
Expected	318.9	666.4	429.7	1415
Observed	234*-	689*	492*	1415
Difference	84.9	22.6	62.3	0
Obs. % of Total	16.5%	48.7%	34.8%	100 0%

table cont'd	VLittle	Somewhat	VMuch	Total
Education				
Expected	438.8	917.0	591.2	1947
Observed	445*	889	613*-	1947
Difference	6.2	28.0	21.8	0
Obs. % of Total	22.9%	45.7%	31.5%	100.0%
Engineering				
Expected	615.3	1285.7	829.0	2730
Observed	850*	1297	583*-	2730
Difference	234.7	11.3	246.0	0
Obs. % of Total	31.1%	47.5%	21.4%	100.0%
Human Ecology				
Expected	146.5	306.1	197.4	650
Observed	104*-	305	241*	650
Difference	42.5	1.1	43.6	0
Obs. % of Total	16.0%	46.9%	37.1%	100.0%
Humanities				
Expected	210.5	439.9	283.6	934
Observed	144*-	361*-	429*	934
Difference	66.5	78.9	145.4	0
Obs. % of Total	15.4%	38.7%	45.9%	100.0%
Science				
Expected	375.3	784.2	505.6	1665
Observed	394*	783	488*-	1665
Difference	18.7	1.2	17.6	0
Obs. % of Total	23.7%	47.0%	29.3%	100.0%
Social Science				
Expected	631.1	1318.7	850.2	2800
Observed	414*-	1225	1161*	2800
Difference	217.1	93.7	310.8	0
Obs. % of Total	14.8%	43.7%	41.5%	100.0%
Nursing				
Expected	218.6	456.8	294.5	970
Observed	179	512*	279*-	970
Difference	39.6	55.2	15.5	0
Obs. % of Total	18.5%	52.8%	28.8%	100.0%
TOTAL	4552	9512	6133	20197
% of Total	22.5%	47.1%	30.4%	100.0%

*$p < .05$

- denotes less than expected frequency